ABSTRACT

CORRECTION FOR NON-LINEARITIES IN FTIR PHOTO DETECTORS

A method and for acquiring interferogram data and a Fourier transform spectrometer, including a detector that provides an output signal that exhibits non-linear distortion in a measured interferogram represented by a power series $I_m = a_1 I + a_2 I^2 + a_3 I^3 + \ldots$, comprising the steps of representing a measured spectrum as $S_m = a_1 S + a_2(S*S) + a_3 (S*S*S) + b_3 (S*S*S*S) + \ldots$ where S is the spectrum of the linear interferogram and * indicates convolution, expressing a linear interferogram I as a power series of a measured interferogram I_m as in $I = b_1 I_m + b_2 I_m^2 + b_3 I_m^3 + \ldots$, expressing the linear spectrum as a power series of the spectra of the interferogram powers $S = b_1 S_1 + b_2 S_2 + b_3 S_3 \ldots$, and obtaining the coefficients b_i where $S = 0$.